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SANDIA NATIONAL LABORATORIES
CHEMICAL & DISPOSAL ROOM PROCESSES DEPARTMENT 6832
WASTE ISOLATION PILOT PLANT PROJECT
TECHNICAL OPERATING PROCEDURE (TOP)

TOP-566

CALIBRATION, USE, AND MAINTENANCE OF
THE SARTORIUS ELECTRONIC TOP LOADER MODEL 1364 MP6 BALANCE

Revision 1

Approved for Issuance:	<u>Original Signed By Steven P. Miller</u>	<u>10-1-97</u>
	SNL QA Reviewer	Date

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1.0 PURPOSE

This procedure provides for the calibration, operation, maintenance of the Sartorius balances Model 1364 MP6 in building 823, rooms 2079 and B45, as part of the laboratory geochemistry research activities in support of the Waste Isolation Pilot Plant (WIPP) Project.

2.0 SCOPE

This procedure is applicable only for the Sartorius balances Model 1364 MP6 in building 823, rooms 2079 and B45.

This document is not meant to substitute for the manufacturer's instruction manuals for the balances. The user is responsible for reading and understanding the appropriate manuals.

3.0 TECHNICAL, REGULATORY, AND QA PROGRAM REQUIREMENTS

This procedure describes the use of a laboratory balance for various activities that are part of the laboratory geochemistry research activities in support of the Waste Isolation Pilot Plant (WIPP) Project. There are no special related technical or regulatory requirements. The QA program requirements that apply are listed in Sections 6.0 and 9.0.

4.0 SAFETY

This document does not address ES&H issues. Laboratory ES&H procedures described in the SOPs in which the equipment is used shall be adhered to.

These SOPs are the following: SP472968 - ES&H Standard Operating Procedure, Geochemical Research in the Department 6832, Water-Chemistry Laboratory, Building 823, Room 2079 (U); and SP472799 - ES&H Standard Operating Procedure, Geochemical Research in the Department 6832 Colloid and Sorption Laboratory, Building 823, Room 2079 (U).

5.0 RESPONSIBILITIES

The Principal Investigator (PI), or designee, whose activities warrant the use of this procedure is responsible for implementing the requirements of this procedure.

The Technical Staff, or designee, is responsible for performing the calibrations and measurements following the requirements of this procedure, documenting calibrations, and assuring that the latest revision of this document is followed.

6.0 CONTROLS

Controls are established by written procedures or instructions prepared in accordance with QAP 5-3, PREPARING, REVIEWING, AND APPROVING TECHNICAL OPERATING PROCEDURES (Revision 4, effective date: 9/30/97) of the Sandia National Laboratories WIPP Quality Assurance Program. Procedures are issued in accordance with QAP 6-1, "DOCUMENT CONTROL SYSTEM", revision 2, effective date 9/13/96 (or latest revision) of the Sandia National Laboratories WIPP Quality Assurance Program.

6.1 STANDARDS

Calibration will be verified using commercially obtained weights that are traceable to NIST or other nationally recognized standards. The serial numbers and expiration dates (if any) of the certifications of the weights used shall be recorded in the laboratory notebook.

The weights shall not be used past the expiration date listed on the container by the certifying organization.

6.2 FREQUENCY

The balance will be recalibrated upon failure of a performance test, this calibration will be noted in the balance's scientific notebook.

The instrument's calibration shall be verified with performance tests immediately prior to use.

6.3 PERFORMANCE TEST CRITERIA

Use at least three NIST-traceable weights, two of which bound your expected “unknowns”. Record each weight number and associated “indicated” balance reading in the scientific notebook.

Performance tests will be done by weighing the NIST-traceable weights. The maximum acceptable deviations from the nominal values for each weight are as follows:

0-800g: plus or minus 0.05g
800-4000g: plus or minus 0.08g

When using a weight (or combination of weights) not listed above, use the next lowest value as your maximum allowable deviation.

Any one measurement’s deviation in excess of the maximum allowable deviation listed for that weight constitutes a failed performance test.

6.4 CORRECTIVE ACTION

Check the balance and work area for interference, correct the problem, if any, and repeat the weighing. If the performance check still fails, recalibrate the balance as per its manual’s instructions (see section 6.5) and repeat the performance check. If the instrument still fails, it shall be tagged and taken out of service until repaired.

6.5 CALIBRATION

Calibrations will be performed as per instructions on pages 1-2 of the attached Appendix (See Appendix A).

7.0 PROCEDURE

Analyses shall be performed as per instructions on pages 1-2 of the attached Appendix (see Appendix A).

When handling weights, always use gloves or tweezers. Never touch the weights with your bare hands. Delicately remove chemicals, dust, and debris from the balance pan before you place the weights on it. Minimize dust accumulation on the weights by keeping them in their container with the lid closed. Be careful to prevent weight-set mix-ups, move only one weight at a time from its box.

Always weigh samples on weighing paper or in an appropriate container. Do not weigh objects heavier than those recommended by the manufacturer. Keep weighing pans/platforms clean of debris and spills.

8.0 MAINTENANCE

Maintenance and routine calibrations will be performed every 6 months by Jay Hagerman of QA Balance Services, Inc., or his equivalent. These calibrations will be performed in accordance with QAP 12-2, "WIPP Calibration Quality Assurance Program", latest revision.

9.0 QA RECORDS

Calibrations and performance test results will be recorded in the laboratory notebook in accordance with Sandia National Laboratories WIPP Quality Assurance Program Procedure 20-2, "PREPARING, REVIEWING, AND APPROVING SCIENTIFIC NOTEBOOKS", revision 2, effective date 7/31/97 (or latest revision). The laboratory notebook will be submitted to the Sandia WIPP Central File in accordance with QAP 17-1, "WIPP QUALITY ASSURANCE RECORDS SOURCE REQUIREMENTS", revision 2, effective date 9/12/96 (or latest revision).

10.0 REFERENCES

Sartorius GmbH, *Instructions for Installation and Operation Electronic Top-Loader 1364 MP6*, Sartorius GmbH, Gottingen, West Germany

QAP 5-3, PREPARING, REVIEWING, AND APPROVING TECHNICAL OPERATING PROCEDURES (Revision 4, effective date: 9/30/97)

QAP 6-1, "DOCUMENT CONTROL SYSTEM", Revision 2, effective date 9/13/96 (or latest revision).

QAP 12-2, "WIPP Calibration Quality Assurance Program", revision 0, effective date 7/24/96 (or latest revision.)

QAP 17-1, "WIPP QUALITY ASSURANCE RECORDS SOURCE REQUIREMENTS", Revision 2, effective date 9/12/96 (or latest revision).

QAP 20-2, "PREPARING, REVIEWING, AND APPROVING SCIENTIFIC NOTEBOOKS", Revision 2, effective date 7/31/97 (or latest revision).

SP472968 - ES&H Standard Operating Procedure, Geochemical Research in the Department 6832, Water-Chemistry Laboratory, Building 823, Room 2079 (U)

SP472799 - ES&H Standard Operating Procedure, Geochemical Research in the Department 6832 Colloid and Sorption Laboratory, Building 823, Room 2079 (U).

11.0 FORMS

There are no forms associated with this procedure.

12.0 APPENDICES

Appendix A: Sartorius 1364 Operator's Instruction Manual

APPENDIX A SARTORIUS 1364 OPERATOR'S INSTRUCTION MANUAL

Checking the sensitivity

The sensitivity of the balance depends upon varying earth rotation velocities at different points of location, and must therefore be checked and adjusted. The balance must be switched on for at least 30 minutes before the sensitivity test. Once the weight indication - g symbol-lights up, press the tare switch to zero weight indication. Place a weight equal to the weighing range on the balance pan. Weight indication and weight of test weight must correspond. Permissible tolerance: plus or minus 1d. In case of a bigger deviation or if "-H" (end of weighing range), adjust the sensitivity.

Adjusting the sensitivity

The balance determines the correction factor for the sensitivity automatically. This factor is stored and automatically used during each weighing process. There is a correction program that can be called up. The resolution in the adjustment program is higher than in the weighing program. Determine the correction factor very accurately and follow strictly the instructions.

The correction factor is determined as follows:

- Clear balance pan.
- Once the balance has reached stability - g symbol lights up - press tare switch. In the weight indication appears 0.00g. Permissible tolerance: plus or minus 1digit.
- Place test weight on the balance pan.
- Push calibration switch backwards. During the determination of the correction factor the weight indication is blanked out. Plus sign, decimal point and stability indication g are flashing. An acoustic signal indicates that the correction factor has been determined. The weight of the test weight appears in the weight indication and flashes.
- Release switch used to call up the correction program. If a weight is displayed which deviates more than plus or minus one digit from the test weight, repeat the sensitivity adjustment. Remove test weights from the balance pan.

Checking and adjusting the sensitivity

It is recommended to check the sensitivity of the balance once a week to guarantee correct weighing results. To perform the sensitivity tests, test weights are available and listed under "Accessories". The balance must be switched on for at least 30 minutes before the sensitivity test. Carry out the following instructions:

- Once the balance has reached stability - g symbol lights up - press tare switch to zero the balance.
 - Place test weights equal to the weighing range on balance pan.
- Weight indication and weight of the test weight must correspond; permissible tolerance is plus or minus 1d. If this is not the case, carry out the sensitivity adjustment.

APPENDIX A SARTORIUS 1364 OPERATOR'S INSTRUCTION MANUAL

Operating instructions

Switch on balance with power switch. Each segment of the weight indication is now automatically checked - the weight indication displays plus or minus 8888888. -followed by an automatic taring (weight indication 0.00g). The operating temperature will be reached after 30 minutes, and the balance will then be ready for operation. With model 1364 MP6 the weight result can be determined with a standard deviation (precision) of $<1d_d$ within a range of plus or minus $8000d_d$. If this range has been exceeded, the standard deviation is $<2d_d$. By pressing the tare switch - to zero the balance - the range with a standard deviation of $<1d_d$ can be recalled again.

Note: Model 1364 MP6 - After pressing the tare switch an acoustic signal indicates that the taring function has been completed. The weight indication is blanked out until taring has been realized (when stability has been reached).

Weighing an unknown sample

- Set weight indication with tare switch to zero, once stability has been reached, g symbol lights up.
- Place sample on balance pan.
- Once g symbol lights up, read off weight.

If the weighing range has been exceeded, "-H." will be displayed

Weighing in a preselected amount of sample

- Place tare vessel on balance pan.
- Once stability has been reached - g symbol lights up - press tare switch.
- Fill in sample material into the vessel until the preselected weight is displayed.

In case further components have to be weighed in, this procedure can be repeated as often as necessary within the weighing range. The gross weight is indicated with a minus sign when pressing the tare switch once the balance has reached stability, before removing the sample.

Check weighings

- Press tare switch;
- Place nominal weight on balance pan;
- Press tare switch;
- Remove nominal weight and place sample on balance pan.

Plus or minus deviations from the nominal weight are now displayed.

Note: Model 1364 MP6 is equipped with a hook for weighings below the balance. If the balance should be used for weighing below, push the cover plate in the base plate of the balance aside.